

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method in a data processing system for monitoring the execution of a program, the method comprising:
 ~~associating instructions for calls and returns in the program with a set of indicators;~~
 in a system having an indicator location associated with each instruction, storing a respective indicator in the indicator location associated with each call and return in the program; and
 executing the program using a processor, wherein the ~~[[set of]]~~ respective indicators associated with the ~~instructions causes~~ calls and returns cause the processor executing the instructions to generate data on calls and returns in the program.
2. (Currently amended) The method of claim 1 further comprising:
 responsive to identifying an instruction in an instruction cache for execution during execution of the program, determining whether an indicator ~~from the set of indicators~~ is stored in the respective indicator location associated with the instruction; and
 generating an interrupt if the indicator is stored in the respective indicator location associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.
3. (Currently amended) The method of claim 1, wherein execution of an instruction having an indicator stored in the indicator location associated with the instruction ~~an indicator in the set of indicators~~ causes passing of control to at least one of a process that records calls and returns and a process that identifies a calling routine.
4. (Cancelled)
5. (Currently amended) The method of claim ~~[[4]]~~ 3 further comprising:
 ~~associating~~ storing respective indicators in the indicator locations associated with instructions in the calling routine; ~~routing with the set of indicators;~~ and

executing the program using a processor, wherein the ~~[[set of]]~~ respective indicators associated with the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.

6. (Currently amended) The method of claim 1, wherein the ~~set of indicators~~ indicator locations are located in a shadow memory.

7. (Original) The method of claim 1 further comprising:
identifying a called routine.

8. (Currently amended) A data processing system for monitoring the execution of a program, the data processing system comprising:

a processor connected to a memory, said processor and said memory being configured with an indicator location associated with each instruction;

~~associating means for associating instructions for calls and returns in the program with a set of indicators~~ storing instructions for storing respective indicators in the indicator locations associated with calls and returns in the program; and

~~executing~~ [[means]] instructions for executing the program using ~~[[a]]~~ the processor, wherein the ~~[[set of]]~~ respective indicators associated with the instructions causes the processor executing the instructions to generate data on calls and returns in the program.

9. (Currently amended) The data processing system of claim 8 further comprising:

~~determining~~ [[means]] instructions, responsive to identifying an instruction in an instruction cache for execution during execution of the program, for determining whether an indicator ~~from the set of indicators~~ is stored in the indicator location associated with the instruction; and

~~generating~~ [[means]] instructions for generating an interrupt if the indicator is stored in the indicator location associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.

10. (Currently amended) The data processing system of claim 8, wherein execution of an instruction having an indicator stored in the indicator location associated with ~~an indicator in the set of indicators~~ the instruction causes passing of control to one of a process that records calls and returns and a process that identifies a calling routine.

11. (Cancelled)
12. (Currently amended) The data processing system of claim 8, wherein execution of an instruction associated with an indicator in the set of indicators causes passing of control to a process that identifies a calling routine;
wherein the associating ~~means is a~~ instructions are first associating ~~[[means]]~~ instructions and further comprising:
second associating ~~[[means]]~~ instructions for storing an indicator in the indicator location ~~associating associated with~~ instructions in the calling routine; ~~routing with the set of indicators;~~ and
executing ~~[[means]]~~ instructions for executing the program using a processor, wherein the ~~[[set of]]~~ indicators stored in the indicator locations associated with the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.
13. (Currently amended) The data processing system of claim 8, wherein the ~~set of indicators~~ indicator locations are located in a shadow memory.
14. (Currently amended) The data processing system of claim 8 further comprising:
identifying ~~[[means]]~~ instructions for identifying a called routine.
15. (Currently amended) A computer program product in a recordable-type computer readable medium for monitoring the execution of a program, the computer program product comprising:
~~first instructions for associating instructions for calls and returns in the program with a set of indicators~~ first instructions for storing respective indicators in the indicator locations associated with calls and returns in the program, wherein the system has an indicator location associated with each instruction;
and
second instructions for executing the program using a processor, wherein the ~~[[set of]]~~ respective indicators stored in indicator locations associated with the instructions causes the processor executing the instructions to generate data on calls and returns in the program.
16. (Currently amended) The computer program product of claim 15 further comprising:
third instructions, responsive to identifying an instruction in an instruction cache for execution during execution of the program, for determining whether an indicator is stored in the indicator location ~~from the set of indicators is~~ associated with the instruction; and

fourth instructions for generating an interrupt if the indicator is stored in the indicator location associated with the instruction, wherein the interrupt causes execution of a program to generate data on the calls and returns in the program.

17. (Currently amended) The computer program product of claim 15, wherein execution of an instruction having an indicator stored in the indicator location associated with ~~an indicator in the set of indicators~~ the instruction causes passing of control to one of a process that records calls and returns and a process that identifies a calling routine.

18. (Cancelled)

19. (Currently amended) The computer program product of claim ~~[[18]]~~ 17 further comprising:
fifth instructions for ~~associating~~ storing a respective indicator in the indicator locations associated with instructions in the calling routing routine with the set of indicators; and
sixth instructions for executing the program using a processor, wherein the ~~[[set of]]~~ indicators stored in indicator locations associated with the instructions causes the processor executing the instructions in the calling routine to generate data on calls and returns in the calling routine.

20. (Currently amended) The computer program product of claim 15, wherein the ~~set of indicators~~ indicator locations are located in a shadow memory.

21. (Original) The computer program product of claim 15 further comprising:
seventh instructions for identifying a called routine.

22. (New) The method of claim 1, wherein the respective indicators each include an element chosen from the group consisting of a flag, a tag field, a threshold, and a count field.

23. (New) The data processing system of claim 8, wherein the respective indicators each include an element chosen from the group consisting of a flag, a tag field, a threshold, and a count field.

24. (New) The computer program product of claim 15, wherein the respective indicators each include an element chosen from the group consisting of a flag, a tag field, a threshold, and a count field.